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DRAFT CHAPTER 24 OF THE COMPREHENSIVE STATE OF THE ENVIRONMENT REPORT *
(1972-1992)

Note by the Executive Director

As it is unlikely that the full Comprehensive Report on the State of the World Environment since 1972, requested by the Governing Council in its decision 15/13 A of 23 May 1989 for submission to the Council at its seventeenth session, will be available at the time of the United Nations Conference on Environment and Development in June 1992 (as requested in the Council's decision 16/15 C of 31 May 1991), the Executive Director has decided to provide the attached provisional Chapter 24 of the Comprehensive Report which contains a summary and the conclusions of the Report for the information of the Governing Council.

* *The final text of the chapter and the title of the Report are subject to change.*

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Introduction

Ten years ago, UNEP's publication "The World Environment 1972-1982" concluded with the observation that:

> "At the Stockholm conference it was generally assumed that the world's system of national Governments, regional groupings and international agencies had the power to take effective action ... By the early 1980s there was less confidence in the capacity of national and international managerial systems to apply known principles and techniques, or in the effectiveness with which international debates lead to action ... Restoration of confidence and consensus in these areas may be the greatest challenge for those seeking to improve the world environment in the 1980s." (UNEP 1982)

It is disturbing that the same statement is still valid a decade later. Indeed, many of the concerns identified in the earlier report remain the same. There are still serious gaps in our understanding of the environment, our ability to estimate the cost of repairing the damage we have done to it, and our knowledge of the cost of failing to take rapid action to halt its degradation. Twenty years after Stockholm, it is still not possible to describe the state of the world environment comprehensively or to say with confidence that the Governments of the world have the knowledge or the political will to deal with the global problems which we already know exist.

The most significant concerns remain the lack of many of the prerequisites for informed decision-making and good environmental management, in particular:

* The database is still of variable quality, with a shortage of data from developing countries. As a result, comprehensive data on the major environmental problems cannot be compiled and 'best estimates' are all that are available.

* Despite great advances in science, remote sensing and the technical ability to monitor the world environment, these have not been generally applied, mainly because of a lack of equipment and trained personnel in many countries.

* There has been no general agreement on the socio-economic indicators of a healthy relationship between people and their environment or on standards for a decent environment.

* Comprehensive assessments of the environmental situation and of the earth's carrying capacity are, in consequence, still difficult.

Despite these concerns there has been clear progress in a number of areas during the past decade. The scientific assessment of stratospheric ozone depletion and understanding of the processes involved have progressed very rapidly and been matched by international and national actions to redress the situation. A strong scientific consensus is now emerging on climate change and loss of biodiversity, their causes and the need for a collective response. Some progress has been made in dealing with the problems of hazardous wastes and toxic chemicals. And there are more and better overall assessments of the environment backed by improved data compendia.

A review of the trends during the last two decades in each of the ten major environmental issues shows that:

* Urban air pollution has been improving in most cities in the developed world, but deteriorating markedly in developing countries. Further work and much greater international cooperation are needed to deal with the issues of transboundary and global pollution of the atmosphere.

* Rapid advances in scientific understanding of stratospheric ozone depletion and its causes indicate that further actions to protect the ozone layer will be required if Governments are to avert significant health and economic effects.

* Despite the uncertainties inherent in such a complex system, increased understanding of the causes and possible effects of climate change indicates a range of global strategies which should be adopted urgently to ameliorate its effects.

* Access to fresh water and the quality of available water supplies are key factors in development, particularly in arid or semi-arid areas. Urgent action is needed to improve both knowledge and management of shared freshwater resources and to establish cooperative management of freshwater basins so as to avoid the potential for conflict.

* While progress has been made through a number of regional seas action plans to halt the further degradation of coastal zones, seas and oceans, urgent action is needed to deal with the problems of land-based sources of marine pollution, unsustainable use of marine resources and rehabilitation of degraded areas.

* Degradation of arid lands - and desertification in particular - is a grave and growing problem and its socio-economic as well as its physical causes must be addressed urgently. A realistic programme of corrective action and rehabilitation in land already subject to desertification must begin.

* Deforestation, the destruction of wetlands and other forms of habitat loss are threatening the stability of local and regional environments and wasting valuable resources. Regional, subregional and national actions, within agreed global targets, are urgently needed to halt and reverse the pattern of deforestation and habitat loss in all regions.

* The loss of biological diversity, expressed in the current rapid extinction of species and reduction of genetic variability, is an unnecessary waste of irreplaceable resources needed for sustainable development. Urgent action is needed to save, study and use rationally the world's biological riches.

* Human activity has increased both the range and the scale of environmental hazards to which people are exposed. Action is needed both to reduce the risk of disasters (particularly from human causes) and to improve our ability to respond to those that cannot be avoided.

* The generation and disposal of hazardous wastes and the production of toxic chemicals pose significant threats to human well-being. International action to improve our knowledge and control of them is urgently needed.

These issues arise from human actions, and are of concern principally because their effects impinge on human well-being – either directly or by undermining the life-support systems of the environment. Usually these are matters of scale, arising because resource demands or pollutant discharges exceed the capacity of the biosphere. Human actions to meet human needs (real or perceived) in agriculture, in industrial development, in satisfying demands for energy, transport and leisure activities have breached the limits or 'carrying capacity' of the physical environment. These limits, set principally by the ability to reproduce renewable resources and the capacity to assimilate the wastes (hazardous or otherwise) that human activities produce, have been exceeded in most parts of the world.

In the meantime, the world population has been growing at an alarming rate and with extraordinarily diverse population densities in ecosystems of widely divergent carrying capacities. In some places, imbalances between population and resources have been aggravated by harsh environmental and climatic conditions. The results are painfully clear today, evidenced by the serious problems arising throughout the world in ensuring that people have acceptable living conditions, reasonable health standards and opportunities for lives of quality.

How we respond, individually and collectively, at the global, national or community level will hold the key to our future and that of our descendants. It is the level of awareness and the individual perceptions of people which will ultimately determine whether Governments and businesses integrate environmental concerns into their development plans and economic activities. In recent years there has been a marked increase in public awareness of environmental issues, and rising demands for action on them. There has also been an enormous growth in the scientific knowledge relating to these issues. Instruments such as the Precautionary Principle, the Polluter Pays and User Pays Principles and techniques such as Environmental Impact Assessment have been adopted as policy by some Governments. The debate of the last two decades on environment and development, and the studies of the interrelationships between people, resources, environment and development called for by the United Nations General Assembly in the mid-1970s (see, for example, resolution 3345 (XXIX) of 17 December 1974) have also led to a growing consensus on the key issues and goals - most notably, sustainability.

I. THE GRAND DEBATE: UNDERSTANDING ENVIRONMENT AND DEVELOPMENT INTERRELATIONSHIPS AND PRACTISING INTERDEPENDENCE

1. Concern for the environment is as old as human civilization. History abounds with examples of the wide variations in man's understanding of his environment and his ability to maintain it in a healthy condition that sustains life. Those societies that managed to meet their material, cultural and spiritual needs in a sustainable manner were those that succeeded in reconciling their needs and aspirations with the maintenance of a viable environment. Whenever the outer limits of the physical environment were exceeded, civilizations declined or even vanished.

2. Since signs of irreparable damage to the environment threatened both the inner limits of basic human needs and the outer limits of the planet's physical resources, we have witnessed a quantum jump in concern for the environment. The Stockholm Conference in 1972 turned a new page of the book of human concern for the environment. The two decades since Stockholm have seen intensive discussion of the interactions between environment and development. A few examples suffice to show how much environmental concerns influenced such discussion.

3. ***The World Models***: Early on, the Club of Rome decided to initiate a project on "The Predicament of Mankind". Phase One of the project resulted in the well-known "Limits to Growth" report in 1972, followed in 1974 by the second Club of Rome report "Mankind at the Turning Point". This heralded a series of world models, most prominent among which are the "Latin American World Model" (Bariloche Model), the OECD "Interfutures", and the United Nations "Future of the World Economy" (Leontief). Despite their different objectives, methodologies, assumptions and approaches (and notwithstanding any shortcomings they had), in each of them the rational use of natural resources and the dangers of environmental degradation figure prominently.

4. ***The United Nations Development Decades***: The United Nations International Development Strategies for the Third and Fourth Development Decades (United Nations 1980, 1990), in particular, emphasize that human health and well-being depend on the maintenance of the integrity and productivity of the environment and its resources.

BOX 1

ENVIRONMENT AND DEVELOPMENT

1972 *The capacity of the earth to produce vital renewable resources must be maintained and, wherever practicable, restored or improved.*

• • •

The protection and improvement of the human environment is a major issue which affects the well-being of peoples and economic development throughout the world.

Stockholm Declaration

1972 *Taking no action to solve these problems is equivalent to taking strong action ... A decision to do nothing is a decision to increase the risk of collapse.*

Club of Rome: ***The Limits to Growth***

1975 *Environmental management implies sustainable development.*

UNEP Governing Council

1980 *Human beings ... must come to terms with the reality of resource limitation and the carrying capacities of ecosystems and must take account of the needs of future generations.*

IUCN/UNEP/WWF: ***World Conservation Strategy***

1987 *In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony.*

WCED: ***Our Common Future***

1987 *Anticipatory and preventive policies are the most effective and economical in achieving environmentally sound development.*

UNEP: ***Environmental Perspective to the Year 2000 and Beyond***

1989 *... No Government can say with certitude that it has attained environmentally sound development or, indeed, has available the methodology to do so.*

UNEP Governing Council: ***Decision 15/2, Annex I***

1990 *To achieve sustainable development, policies must be based on the precautionary principle.*

Bergen Declaration, Bangkok Declaration

1991 *Sustainability will be impossible unless human population and resource demand level off within the carrying capacity of the Earth.*

IUCN/UNEP/WWF: ***Caring for the Earth***

BOX 2

ENVIRONMENT AND ECONOMICS

1971 *For society as a whole, environment is a part of its real wealth and cannot be treated as a free resource.*

Environmental issues may come to exercise a growing influence on international economic relations. They ... could influence the pattern of world trade, the international distribution of industry, the competitive position of different groups of countries, their comparative costs of production, etc.

Some environmental actions by developed countries ... are likely to have negative effects on developing countries' export possibilities and their terms of trade.

Founex Report

1972 *GATT, among other international organisations, could be used for the examination of the problems [of trade and the environment], specifically through the recently established Group on Environmental Measures and International Trade.*

Stockholm Plan of Action: Recommendation 103

1987 *Incomplete accounting occurs ... especially in the case of resources that are not capitalised in enterprise or national accounts: air, water, and soil.*

WCED: ***Our Common Future***

1987 *Environmentally related regulations and standards should not be used for protectionist purposes.*

UNEP: ***Environmental Perspective to the Year 2000 and Beyond***

5. ***United Nations General Assembly Resolutions***: As early as 1974, the General Assembly passed its first resolution on the "Interrelationships between Population, Resources, Environment and Development". Ever since then, the subject has continued to come up for review of United Nations efforts in coordinating multidisciplinary research and pilot field experiments on these interrelationships. In 1987, General Assembly resolutions 42/186 and 42/187, respectively welcoming and endorsing UNEP's "Environmental Perspective to the year 2000 and Beyond" (UNEP 1987) and the report of the World Commission on Environment and Development "Our Common Future" (WCED 1987), heralded a period of intensive review of development strategies guided by the recommendations of the two reports. Since that time, the General Assembly has received regular reports from the Secretary-General of the United Nations on how Governments and United Nations organs are implementing these recommendations. The debate finally led the General Assembly to convene the United Nations Conference on Environment and Development, which will be held in Rio de Janeiro, Brazil in June 1992.

6. The last two decades have also given rise to the creation of a number of commissions and the carrying out of studies to investigate the current and future condition of the world at large and to recommend appropriate actions for sustainable and equitable development on a global scale. The reports include "North-South: A Programme for Survival" (Brandt 1980); "The Global 2000 Report to the President of the U.S." (Barney 1980); "The World Conservation Strategy" (IUCN/UNEP/WWF, 1980); "A World at Peace: Common Security in the Twenty-first Century" (Palme, 1989); and "Caring for the Earth: A Strategy for Sustainable Living" (IUCN/UNEP/WWF 1991).

7. The report of the World Commission on Environment and Development, the "Environmental Perspective to the Year 2000 and Beyond" and "The Challenge to the South" - the report of the South Commission (Nyerere 1991) - specifically addressed the question of sustainable development. Although these reports have tackled different issues, using different criteria and with different objectives, each addressed the complex relations between the physical environment, development efforts and the human condition.

BOX 3

ENVIRONMENT AND INTERNATIONAL RELATIONS

1972 *States have ... the sovereig.. right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of their national jurisdiction.*

Stockholm Declaration: ***Principle 21***

1984 *It cannot be too much or too often emphasised how crucial the dialogue between and amongst the developed and developing countries is for the appropriate solutions of environmental problems.*

UNEP: ***State of the Environment 1984***

1987 *Awareness of the environmental aspects of international economic relations has increased but it has not yet found adequate expression in institutional practices and national policies.*

UNEP: ***Environmental Perspective to the Year 2000 and Beyond***

1989 *The responsibility for ensuring a better environment should be equitably shared and the ability of developing countries to respond be taken into account.*

Langkawi Declaration

1990 *If the multiple bonds that characterise interdependence are convincingly present in any field, it is in that encompassing development and the environment ... But the transition is not occurring smoothly and harmoniously; it is turbulent and beset with conflict.*

South Commission: ***The Challenge to the South***

BOX 4

ADDITIONAL FINANCIAL RESOURCES

1971 *Looking at the problem [of who pays for the higher cost arising out of the environmental concerns] strictly from the point of view of the developing countries, it is quite clear that additional funds will be required.*

Founex Report

1972 *The General Assembly ... decides that the Governing Council [of UNEP] shall have the following main functions and responsibilities:*

... (f) To maintain under continuing review ... the problem of additional costs that may be incurred by developing countries in the implementation of environmental programmes and projects, and ...

United Nations General Assembly: ***Resolution 2997 (XXVII)***

1981 *The General Assembly [recognizes] that environmental deficiencies generated by the conditions of under-development pose grave problems and can best be remedied by accelerated development through the transfer of substantial quantities of financial and technical assistance.*

United Nations General Assembly: ***Resolution 36/192***

1989 *The Governing Council [of UNEP] believes that the international community must not only commit itself generally to the proposition that such additional resources are needed, but must specifically identify their possible sources.*

UNEP Governing Council: ***Decision 15/2***

8. In addition, during the last two decades UNEP has commissioned, sponsored and itself undertaken work on many of the concepts that lie behind sound environmental management. The resulting reports and publications have dealt with issues as diverse as the interrelationships between people, resources, environment and development; the effect of different patterns of development and lifestyles on the environment; the integration of environment into development planning; and the techniques of resource accounting and environmental economics. There have also been innumerable national, regional and international meetings and publications, addressing various aspects of the relationship between environment and development and the concept of sustainable development.

9. Twenty years after Stockholm, it is both useful and sobering to review some of the main ideas, principles and concepts that were enunciated during this grand debate. They covered new international development strategies, new lifestyles, the strong ties between environment and economics, the need for additional financial resources and technology transfer, inter- and intragenerational equity, the precautionary principle, the rights and responsibilities of States and several others (see Boxes 1-6).

10. Such a review reveals two significant facts. The first is *the enduring relevance and validity of these ideas and concepts*; the second, that *issues identified two decades ago remain with us today*. The ideas have continued to be reiterated ever since the preparatory meetings for the Stockholm Conference - particularly the Founex meeting almost one year before the conference - and in the Conference Declaration and Action Plan. *But there has been little success translating known solutions to environmental problems into concrete action.* Despite all the reflection and debate, our environment continues to deteriorate and living conditions in many parts of the world continue to decline.

11. Familiar problems get worse, while new environmental threats are revealing themselves. The present generation of human beings carries a terrible responsibility for its lack of action on almost every front.

BOX 5

TECHNOLOGY TRANSFER

1971 *It is quite likely that future technological developments in the developed world will be influenced by their current preoccupation with non-pollutive technology ... It is also obvious that some of this non-pollutive technology would be quite costly for the developing countries ... its export to developing countries under tied credits will further reduce the real content of foreign assistance.*

Founex Report

1972 *It is recommended that the Secretary-General [of the United Nations] be asked to ... find means by which environmental technologies may be made available for adoption by developing countries under terms and conditions that encourage their wide distribution without constituting an unacceptable burden to developing countries.*

Stockholm Plan of Action: ***Recommendation 108***

1987 *Transfer of clean, low-waste and pollution control technologies should be promoted ... The scope to make available such technologies at concessional prices to the countries in need should be explored.*

UNEP: ***Environmental Perspective to the Year 2000 and Beyond***

1989 *Governments and intergovernmental trade organizations [are] urged to review terms of trade in pollution control technology with the objective of identifying and minimizing trade barriers.*

UNEP Governing Council: ***Decision 15/37***

1991 *The Governing Council [of UNEP] ... calls upon the Executive Director: ... To promote the identification of ways and means to facilitate access by and transfer of technology to developing countries in respect of cleaner production methods, techniques and technologies.*

UNEP Governing Council: ***Decision 16/33***

1969 I do not wish to seem overdramatic; but I can only conclude ..... that the Members of the United Nations have perhaps ten years left in which to subordinate their ancient quarrels and launch a global partnership to curb the arms race, to improve the human environment, to defuse the population explosion, and to supply the required momentum to development efforts.

U. Thant (United Nations Secretary General)

12. How far did we move to heed this warning? Specifically, how much have we improved the human environment since it was given? The box below contains the answer:

In 1969 the world population was 3.7 billion.
In 1990, it had reached 5.3 billion.
Current growth rate is 1.7 per cent a year [a]

In 1989:

Arms spending was $850 billion ($27000 every second),
Official aid to developing countries was $34.1 billion,
Developing countries paid $59.5 billion in interest. [b]

Today it is estimated that ***every second:***

Over 200 tonnes of carbon dioxide are released and 750 tonnes of topsoil are lost

and that ***every day:***

47,000 hectares of forest are destroyed,
Over 100 square kilometres are turned into desert,
and between 100 and 300 species become extinct, while:
The world's population grows by a quarter million
and 40,000 children die of disease and malnutrition.

sources:

[a] *UNFPA*

[b] *World Bank/UNDP data*

13. This book and the boxes in the present chapter, demonstrate the need to commit ourselves *now* to specific, quantifiable targets over specific periods of time and to set ourselves in earnest to achieve them. And we have to ensure that we have the mechanisms to monitor our progress towards these targets, as well as the courage to acknowledge when we are wrong and the wisdom to correct our path. If we do not, we will be left with more lip-service, more destruction, more misery. Surely the international community does not want this and cannot afford it.

II. THE CHANGING WORLD SCENE

14. The world has not been standing still while the debate on environment and development gathered momentum and ideas, and concepts and issues emerged, were clarified and reiterated. The two decades since 1972 have seen major political, economic and social changes. The global political and economic landscape has altered, not gradually but in a number of dramatic and unforeseeable upheavals. As a result, the ideological and economic world maps of 1972 are no longer accurate in 1992, the geo-political assumptions which accompanied them do not hold true today and the predictions of social change which were based on them have been proved inaccurate.

The Challenge

15. The most dramatic and obvious political changes have been the most recent. The movement towards democratic pluralism and the rejection of Marxist-Leninist economic theory in Eastern Europe have gripped world attention and often dominated the news media since the introduction of 'perestroika' in the USSR in the mid-1980s. However the causes are to be found earlier, in more subtle changes to the prevailing philosophies in both East and West, which have had more profound consequences than was immediately obvious. The change from an essentially bipolar world in which two superpowers and their supporters faced each other across an ideological and political abyss has created both opportunities and uncertainties. It may be some time yet before the geopolitical map 'post-perestroika' is finally drawn, but the nature of that map and the world it represents will owe more to the fundamental causes of those changes than to the changes themselves.

16. The radical optimism of the early 1970s gave way under the pressure of the global economic recession that followed the second oil shock in 1978. The belief, which underpinned the Second United Nations Development Decade and the call for a "New International Economic Order", that institutional solutions could be found to human and social problems was replaced by a more individualistic, inward-looking, market-oriented philosophy. Paradoxically, the same improvements in mass communications which have liberated individuals and fuelled popular demands for political reform have also led to an increased sense of individual helplessness in the face of mounting environmental crises and to greater popular distrust of politically-generated solutions to social, economic and environmental problems.

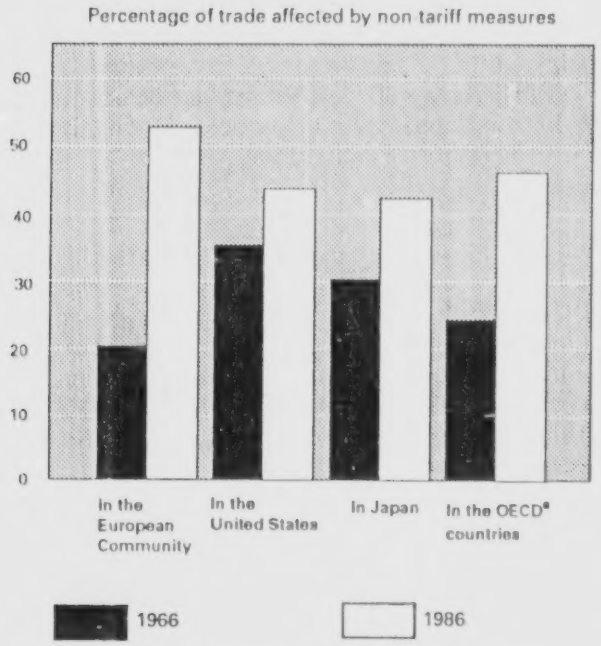
17. The search for greater economic efficiency has led not only to the phasing out of the 'command economies' of Eastern Europe, but to a parallel deregulation of the financial, manufacturing and service sectors in the West. One result has been a freer movement of capital between countries and between sectors. This globalization of production has also been boosted by profound technological changes, particularly the rapid development and spread of informatics technologies. Knowledge suddenly became a business asset, even more valuable than physical or financial resources. The traditional transnational corporation was transformed from a collection of semi-autonomous local affiliates into a widespread network of production and operational facilities that could be monitored and controlled from the centre in 'real time'. At the same time, 'modular' production developed, with specialized firms producing just one module of a total product or service. As a result, many large corporations have come to depend on the small knowledge-intensive enterprise which spends a high proportion of its income on research and development. These changes, among several other things, have further reduced the ability of national Governments to influence the activities of transnational corporations in order to achieve social or environmental goals. While the flight of capital from already under-capitalized countries in the South has continued, there have also been waves of foreign investment in those economies that adapted to the changed economic scene and a gradual dismantling of the rather shaky measures instituted in many developing countries to nurture their emerging industries.

18. The emergence of global markets and economic interdependence has largely been fuelled by the extraordinary growth in trade since the Second World War. In the 40 years following 1950, world manufacturing output increased 7-fold. Between 1950 and 1973, export volumes from industrialized countries increased by 10 per cent per year. Since 1984, the volume of world merchandise trade has consistently risen at a higher rate than growth in world outputs. However, both the trade boom and the growth in the global economy have been highly selective, by-passing most developing countries. Although there has been a significant increase in developing countries' exports of manufactured goods during the last two decades, it is mainly accounted for by the relatively small number of newly industrialized economies. And despite this increase, developing countries' exports are still only 15.5 per cent of world manufacturer trade (UNCTAD, 1990).

19. The few value-added products that are generated in developing countries are often blocked by lack of market access, as developing countries' commodity exports are affected by the "new protectionism" that followed the recession of the early 1980s. Non-tariff barriers, voluntary export restraints, direct and indirect subsidies and other obstacles have made the developing countries' access to Northern markets extremely difficult. According to the World Bank, the percentage of OECD country imports covered by non-tariff barriers almost doubled between 1966 and 1986 (Fig. 1). Moreover, the percentage of trade affected by highly restrictive non-tariff measures is greater for developing countries than for industrialized countries (Fig. 2). Subsidies on agricultural produce within the OECD are in the vicinity of $300 billion per annum. It has been estimated that trade protectionism in developed countries cost the global South around $55 billion in 1980 (in 1990 dollars) (World Bank, 1991).

Figure 1

The share of imports affected by all non-tariff measures, 1966 and 1986



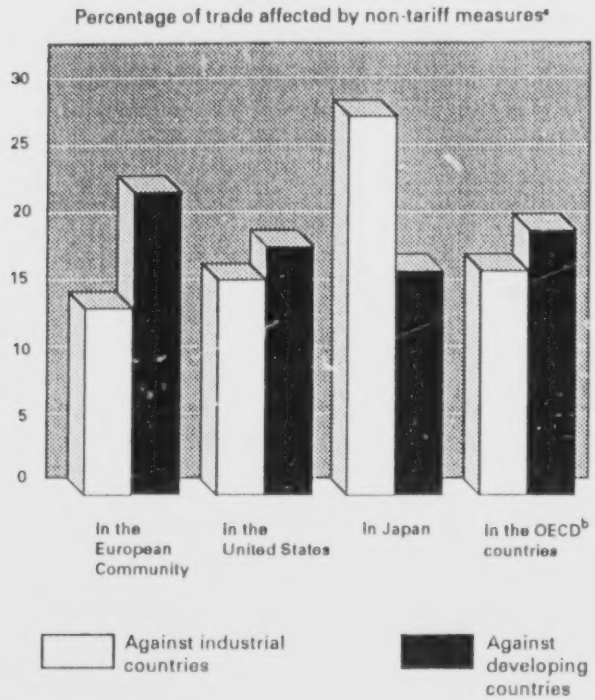
a. Excludes data for Australia, Austria, Canada, Iceland, New Zealand and Sweden.

Source: World Bank 1991

20. Changes in the global economy have had their parallels in intergovernmental trade forums, and produced some significant strains in the Uruguay round of negotiations on the General Agreement on Tariffs and Trade (GATT). While there has been a considerable degree of agreement on the principle of lowering barriers to international trade, and in particular the removal of non-tariff barriers, agreement on concrete actions has been more difficult to achieve. The question of agricultural protectionism, which has significant implications for the world environment, has been one of the most intractable, producing significant disagreements between countries and trading blocs in the North as well as between North and South. While in some areas, notably primary production and commodity trade, a freer (but equitable) world market could reduce the pressure to exceed the carrying capacity of overstressed ecosystems in developing countries, the current trend towards deregulation also poses a threat to the environment.

Figure 2

Hard-core non-tariff measures applied against industrial and developing countries, 1986



a. Calculated using 1981 trade weights. Hard-core non tariff measures including quotas, voluntary export restraints, the Multifibre Arrangement, and other highly restrictive measures.
b. Excludes data for Australia, Austria, Canada, Iceland, New Zealand and Sweden.

Source: World Bank 1991

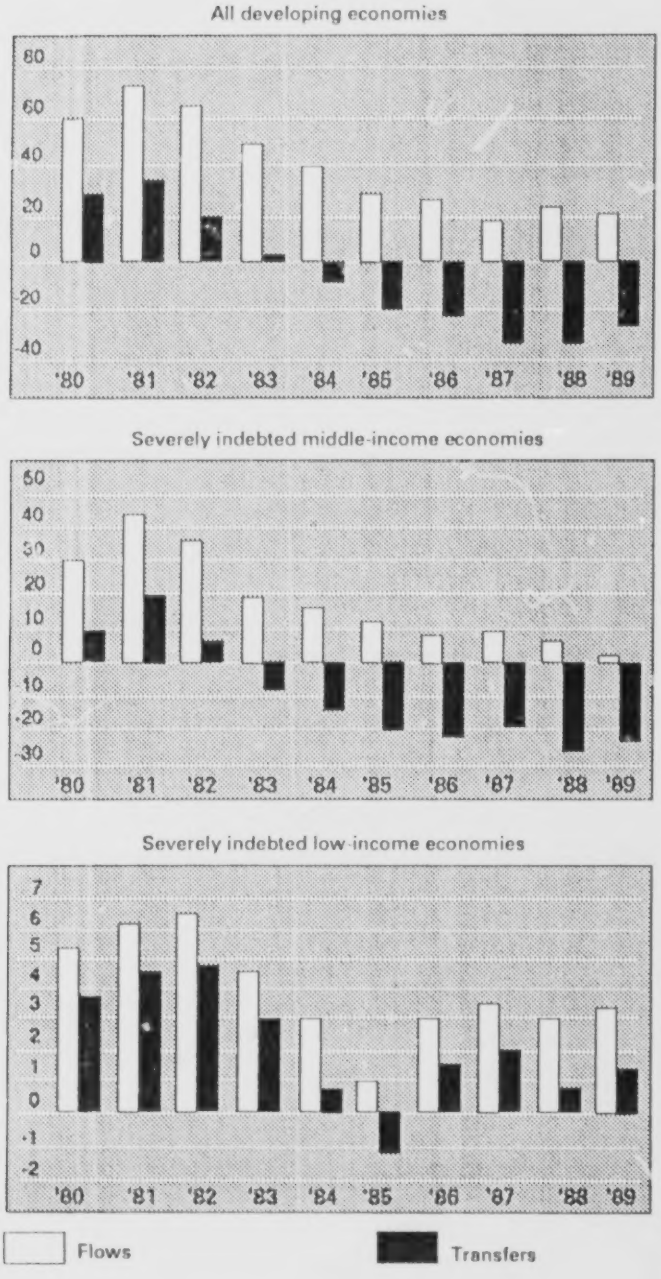
21. A totally deregulated world market suggests a possible conflict with international treaties and national legislation to protect the global commons, for example the Montreal Protocol or the CITES Convention (both of which contain restrictions on trade with non-parties) or measures which might be taken under conventions on climate change or biological diversity. Similar difficulties could arise in connection with any agreements which might be reached to ensure that developing countries have access to environmentally sound technology. The potential for such difficulties was clearly seen as early as the Founex meeting which preceded the Stockholm Conference (see Box 5 in chapter I). The objective, identified in 1971, of reconciling the need for an orderly, fair and efficient system of world trade with the need to preserve the ability of the earth to sustain human life has now become pressing.

22. Over the past 20 years, both the World Bank and the IMF have shifted development priorities from import substitution to export-led growth, accompanied by severe structural adjustment programmes. For most developing countries with scant industrial capacities there is little to export but natural resources, making them almost totally reliant on commodity exports. However, commodity prices have fallen steadily since the early 1970s. By 1986, average real commodity prices were at their lowest recorded levels this century (with the single exception of 1932, the trough of the Great Depression). Prices of two critical export crops - cocoa and coffee - fell even further between 1986 and 1989 (by 48 and 55 per cent respectively). The World Bank forecasts that commodity prices are unlikely to rise during this decade, with intensified South-South competition in saturated markets.

23. The effects of trade protectionism and commodity price collapse on developing country economies are compounded by external debt. It is now clear that the economies of the least developed countries will not be able to grow out of debt, as donor agencies had hoped. By 1989 the external debt of the countries rated as "severely indebted" by the World Bank equalled almost three times their combined export earnings for that year. The total indebtedness of all developing countries was US$988 billion, approaching twice the value of their exports, 22.4 per cent of which went on debt servicing. The most indebted region (relative to its earning capacity) is sub-Saharan Africa, with external debt almost equal to its combined GNP and approaching four times its total exports, a four-fold increase in just nine years (World Bank, 1991).

Figure 3

Net resource flows and net transfers to developing economies, 1980-1989 (billions of dollars)



Note: Data are for all economies reporting transactions to the World Bank and refer to long-term debt, excluding IMF.

Source: World Bank 1990

24. The combined effect of debt servicing and reduced aid is a net financial flow from the South to the North (Fig. 3). In 1989, developing countries paid $59.5 billion in interest on their debts (World Bank, quoted in SIPRI, 1991), and received official development assistance of $34.1 billion (UNDP, 1991). In the same year the official debt of low- and middle-income countries grew by an average of four per cent (World Bank, 1991). Increasing interest payments on a spiralling debt burden can only be met by increasing exports. For countries that are almost totally dependant on commodity exports in a hostile market this means placing greater pressure on the environment and a further reduction in living standards for their people. With a projected one billion additional people sharing scarce resources in the global South in the near future, the pace of environmental degradation seems certain to increase unless the debt crisis is resolved and greater equity introduced into the world's commodity markets.

25. The social and environmental costs of the economic changes of the last two decades have been severe. While the world economy has grown considerably during that period, much of the growth has been in countries which were already consuming an inordinate share of the world's resources. Many of the least-developed countries had little economic growth and a substantial fall in per capita production during the 1980s. Furthermore, the growth was greater in the manufacturing and service sectors than in food production, which (on a per capita basis) declined in the latter half of the 1980s (FAO, 1991). The fall in per capita food production

has been most severe and most sustained in the least-developed countries, while mountains of surplus food are stored in Western Europe and North America. Finally, the growth has been accompanied by a horrifying loss of the world's productive capacity. Between 1970 and 1990 the world population increased by about 1.6 billion. During the same period an estimated 480 billion tons of topsoil were lost and an additional 120 million hectares of desert created (Brown et al., 1991).

26. These changes have been coupled with regional conflicts which have plagued much of South-East Asia, Africa and the Middle East for the last two decades. As a result, glaring anomalies in global patterns of resource consumption have been made worse, the standard of living of the poorest half of the world's population has fallen even further and the incidence of famine and disease in the poorest countries has increased. Greater poverty in the least-developed countries has led to increased environmental degradation and so to a vicious downward spiral of poverty and loss of productive capacity. Furthermore, the least developed countries now face the possible diversion of a substantial portion of existing aid flows and concessional development capital to help with the reconstruction of Eastern Europe.

The Opportunity

27. To concentrate only on the negative statistics of the last two decades and ignore promising present trends and recent events would give a distorted and overly negative picture. While we must accept the reality that the two decades since the Stockholm Conference have seen a considerable degradation of the global environment and a further squandering of the world's stock of productive natural resources, there are also some grounds for optimism. A growing appreciation of the global nature of environmental problems and their implications - not just for the quality of life, but for its very sustenance - has led to a new and more serious approach to environmental issues since the mid-1980s. Governments have displayed a greater willingness to act together to address environmental threats on a global basis, as was demonstrated by the successful negotiation, between 1985 and 1987 of the Montreal Protocol on Substances that Deplete the Ozone Layer, its dramatic strengthening in 1990 and the large number of countries which have ratified it. This rapid and decisive action (at least in terms of international treaty negotiations) and the steps taken since then towards negotiation of conventions on control of hazardous wastes and their disposal, on climate change and on biodiversity would have been hard to predict even a decade earlier. This willingness to act has been accompanied by an encouraging movement away from confrontation and towards a more cooperative approach by Governments in forums dealing with environmental issues. It has thus been possible to develop new and innovative means (for example, the funding mechanism established under the Montreal Protocol and the Global Environmental Facility) to address issues such as the transfer of environmentally sound technology to developing countries and to deal with major environmental problems.

28. Overall, the world community has accumulated a large number of legal instruments which commit it to cooperate in the environmental field. In the 50 years prior to 1972, fewer than 60 environmental treaties were agreed. During the 20 years since Stockholm almost 100 more had been concluded. There are now over 150 multilateral environmental treaties. Yet the efficiency and effectiveness of the legal instruments leave much to be desired, mainly because of the limitations inherent in the traditional negotiating process, limited compliance with existing legislation, the ineffective procedures for enforcement and verification of implementation, and the lack of mandatory jurisdiction in legal instruments for settling disputes. There is now a growing recognition among Governments that the traditional means by which they negotiate and agree on collective action is unlikely to be able to keep pace with growing threats to the world's environmental health.

29. The basic responsibilities and rights of nations relating to the environment have been spelled out in a number of declarations and other statements of principle, including the 1972 Stockholm Declaration, the Nairobi Declaration of 1982, The World Charter for Nature (1982), the Report of the World Commission on Environment and Development (1987) and many others. All these have been adopted, endorsed or welcomed by the United Nations. In addition, there have been many regional and other declarations of a similar nature.

BOX 6

Some principles governing the rights and obligations of people and States in relation to the environment

Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations.

Stockholm Declaration, 1972

It is prohibited to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment.

Additional Protocol I to the Geneva Convention, 1977

[The General Assembly] proclaims the historical responsibility of States for the preservation of nature for present and future generations.

United Nations General Assembly Resolution 35/8, 1980

States shall maintain ecosystems and ecological processes essential for the functioning of the biosphere, shall preserve biological diversity, and shall observe the principle of optimum sustainable yield in the use of living natural resources and ecosystems.

Report of the WCED, 1987 (legal principle 3)

Since mass poverty is often at the root of environmental degradation, its elimination and ensuring equitable access of people to environmental resources are essential for sustainable development.

UNEP: Environmental Perspective to the Year 2000 and Beyond, 1987

States shall develop contingency plans regarding emergency situations likely to cause transboundary environmental interferences and shall promptly warn, provide relevant information to and cooperate with concerned States when emergencies occur.

Report of the WCED, 1987 (legal principle 19)

30. Most of these declarations are of the nature of "soft laws". That is to say, they do not have a legally binding effect but are statements of principle to which Governments give general support or claim to subscribe. Their significance lies in the fact that, taken together, they clearly demonstrate the common, consistently held view of nations that their sovereign rights are circumscribed in the field of environment by a set of higher principles. Whether their espousement of these principles is enough to induce Governments to agree on limitations to or exceptions from the rule of consensus, which is at the heart of the law on treaties, remains to be seen. However, the fact that

almost all (if not all) Governments have repeatedly subscribed to these declarations of principle without reservation for two decades encourages the belief that they may now be ready to streamline and strengthen the negotiating process in the interests of global preservation.

31. The last two decades have also witnessed the rise of non-governmental environmental groups and consumer organizations. These have gained great strength - particularly in the industrialized countries - and influenced, to a large extent, the attitudes of Governments and industries towards the environment and its natural resources.

32. At the same time, a combination of greater public awareness and growing consumer pressure has led to a 'greening' of many businesses. The creation of the Business Council for Sustainable Development and the adoption, by the Second World Industry Conference on Environmental Management (sponsored by the International Chamber of Commerce) of a 'Business Charter for Sustainable Development' are encouraging signs. The last few years have witnessed an emerging tendency among industry leaders in favour of adopting voluntary codes of practice, rather than waiting for (and resisting the imposition of) regulations to protect the environment. Several large-scale enterprises have openly and voluntarily committed themselves to substantial reductions in the release of pollutants over relatively short periods of time. The growing realization that environmentally sound business practices are also good business augurs well for the future. At the same time, a growing number of professional bodies (for example, in the fields of medicine and engineering) have adopted codes of ethics or stated principles relating to professional obligations in regard to the environment.

33. In themselves, these changes in perception and practice are obviously not going to solve the world's environmental problems. However, if they represent a genuine recognition of the seriousness of the situation the world faces, and a real willingness on the parts of industry, Governments and individuals to act together to address it, then there is ground for optimism. The breakdown of the political and ideological barriers dividing East and West presents us with an unequalled opportunity to divert a substantial part of the world's economy from producing weapons of destruction to repairing the environmental damage of the past. If the world is ready to take advantage of this opportunity, then the next twenty years may tell a different story.

III. EPILOGUE

Introduction

34. The present review of environmental trends during the last two decades and of the interactions between human development needs and environmental resources would be incomplete without reference to the lessons it holds for the future. The overriding message it conveys is that human beings and human institutions wait too long before taking action. On nearly every issue we have failed to apply the precautionary principle when it was appropriate - indeed prudent - to do so. We have had more than enough talk about environmental problems. What is needed now is action. This is what the world community, represented by the United Nations General Assembly, expects of Governments as they emerge from the United Nations Conference on Environment and Development in Rio: specific commitments to take specific actions over specific periods of time, with the costs calculated, the sources of funding identified and a clear indication of who will be doing what. Nothing less will suffice.

35. In the following paragraphs we have given some examples of targets which, with real international cooperation, could be achieved during the next two or three decades. They do not by themselves constitute a plan of action to address the environmental problems of the world, and should not be interpreted as such. They are consistent with the goals and targets set out in documents

which have been welcomed or endorsed by the United Nations General Assembly (Environmental Perspective to the Year 2000 and Beyond, UNEP 1987; the report of the World Commission on Environment and Development, WCED 1987; by the Governing Council of UNEP (Goals and Targets, Future Orientation of UNEP's Programme), and several other major documents (World Conservation Strategy, IUCN/UNEP/WWF 1981; Caring for the Earth: A Strategy for Sustainable Living IUCN/UNEP/WWF 1991; Global Biodiversity Strategy WWF/IUCN/UNEP 1991). The list is not exhaustive, but concentrates on the priority areas identified for the work of the United Nations Environment Programme by its Governing Council and by the General Assembly for consideration by UNCED.

36. The time-frames indicated in the targets may be criticized by some as being too liberal or too tight. None the less, they are considered feasible by the experts consulted during their preparation. The costs of attaining them have been indicated, where meaningful estimates are possible and where the targets involve significant increases in expenditure. Each additional year of delay in taking action on them adds to their cost, as it does with all other remedial actions to deal with current and future environmental problems.

37. Finally, it must be stressed that the targets given below are not in any order of priority other than that indicated by the dates for their attainment. It is not possible to set priorities between, for example, actions needed to combat land degradation or marine pollution and between setting up in developing countries an adequate capacity in environmental economics and legislation and developing an effective, internationally agreed means of ensuring compliance with treaties on the environment. Each target represents a priority in its field. The message of this epilogue is the same as the burden of argument throughout the present book: we no longer have the luxury of picking and choosing what to do next, the state of the world environment demands that we pursue actions simultaneously on a broad front with no further delay.

A. Assessing the state of the environment

38. Despite all the talk during the last two decades about the damage occurring to a number of key components of the environment, global assessments of those components have not been undertaken nor have resources been earmarked for them.

1. To complete by the year 2000 comprehensive assessments of:

(a) The status of air quality in urban conglomerations;

(b) Freshwater resources; and

(c) Land and soil degradation.

39. These should include:

The status and trends of air quality in major urban areas, as well as their causes;

Comprehensive assessments of major freshwater resources (covering both quantity and quality), with special attention to assessment of groundwaters and to the likely impacts of climate change on freshwater resources;

Rates and trends of soil loss, as well as vegetation degradation and habitat loss (thus covering the two major problems of desertification and deforestation).

40. These assessments, which should be updated in each subsequent decade, could be carried out within the framework of the Earthwatch system. Their completion will require the provision of adequate additional resources. A rough estimate of the direct cost of collecting data and preparing assessments is in the vicinity of $15 million per year for the remainder of this decade. Additional, much larger, funds will be required to build the institutional capacity of developing countries to take part in the necessary surveys.

2. To survey, by the year 2020, through national biodiversity inventories and programmes, the world's habitats known to be unique, rich in biodiversity or at risk.

41. At present, the full extent of the world's biodiversity, the relative richness of different natural systems and the rate of species loss can only be guessed. Effective natural resource accounting is difficult, the potential benefit lost to humanity from species extinction cannot be estimated and the information on which to base decisions to protect representative ecosystems is often inadequate or unavailable. Substantial resources will be needed to build the capacity of Governments and national institutions in developing countries to undertake the necessary surveys. A very rough estimate of the direct costs, based on the present cost of species identification, suggests that this will require some $300 million per year for the period. The surveys should be 25 per cent completed by 2000 and 50 per cent completed by 2010.

B. Assessing environmental impacts

3. To assess, by the year 1995, the potential benefits and environmental impacts of currently known new and alternative sources of energy.

42. Consideration of the potential benefits of alternative energy sources has not usually included a systematic assessment of the environmental impacts which could arise from their widespread introduction. The benefits and likely environmental impacts should be assessed for each of the currently known 'new' sources of energy, including wind, solar, biomass, geothermal, tidal energy, etc. These assessments should be regularly updated in the light of new information, and the environmental impacts of any further new energy technologies should be evaluated at the time of their development.

4. To assess, by the year 2000, the environmental impacts and benefits of currently existing new technologies and new materials.

43. The potential impacts on the environment of the production and use of new, composite materials and new technologies (including the 'cleaner' technologies introduced to reduce pollution) have not been fully or systematically assessed. As a result, efforts to reduce environmental damage could result in the creation of new and potentially greater sources of harm (chlorofluorocarbons, now known to deplete the ozone layer, were developed to replace substances known to be harmful to human health.) In future, both the environmental impacts and benefits of

new technologies and materials should be carefully assessed during the development phase and updated with improved scientific knowledge.

C. Estimating and accounting for the costs of environmental damage and rehabilitation

5. To produce by 1995 authoritative estimates of the global costs of failing to deal with climate change, ozone layer depletion and loss of biodiversity.

44. Estimates of the cost of dealing with these problems have persuaded some decision makers that taking prompt action to avert them would be too expensive. However, the costs of inaction (or delayed action) have not been systematically assessed. In order to permit proper cost-benefit analyses of action/inaction/delayed action, the costs (both direct, in terms of remedial actions and loss of property, and indirect, in terms of loss of economic opportunity) should be carefully estimated for various scenarios. Collecting and assessing the data required for detailed estimate may take several years (see, for example, subsection 2 above), but the urgent need for better information on which to base decisions suggests that the first estimates should be completed by 1995 and regularly updated in the light of both new information and changing circumstances.

6. To produce, by the year 1995, revised estimates of the additional resources needed for the transfer of knowledge, information and specific environmentally sound technologies to developing countries to allow them to participate meaningfully in dealing with their national as well as global environmental problems. By the same time, agreement should be reached on sources of funding and mechanisms for the transfer of these resources and the required technologies.

45. If we are seriously to address global environmental problems, the transfer of environmentally sound technology to developing countries means more than just transfer of the hardware of production, or even the skills and knowledge associated with particular technologies developed in the North. It includes the range of skills and knowledge required for product design, production and distribution and for the provision of support services and infrastructure by both the public and private sectors. It also includes the transfer of skills and knowledge needed to assist the South to revive and improve its indigenous technologies and to develop new ones. "Environmentally sound" means applying integrated systems of management that minimize environmental degradation through a number of approaches.

46. Some progress has been made in providing additional resources and facilitating access to technologies. Interim funding for technology transfer under the Montreal Protocol has been agreed and the range of additional funds required has been estimated. Funds have been pledged by a number of countries to the Global Environment Facility, administered by the World Bank in cooperation with UNDP and UNEP. However, agreed costings for technology transfer relating to climate change and biodiversity are still remote. Any meaningful action in these two areas (as well as in several others) requires agreement on access to environmentally sound technology on an affordable basis. Additional financial resources are needed to facilitate that access.

7. By the year 2000, all countries should adopt environmental and natural resource accounting as part of their system of national accounts, and capital flows in the form of natural resource imports and exports should be included in international trade statistics.

47. The allocation of natural resources by appropriate economic instruments is an important element in any strategy to achieve sustainable resource use. In order for rational economic decisions to be made by Governments, companies and individuals, the capital cost of development options in the form of natural resource depletion and degradation must be known and all users charged appropriately. Natural resource accounting provides the information needed to assess and monitor the stock of natural assets. These accounts will therefore assist in monitoring the use of resources to assess their sustainability, and in the valuation of environmental goods and services. These values (which go beyond the mere value to be obtained from resource use) will vary with locality and time. For example, the value of one hectare of tropical forest or one tonne of topsoil will depend not only on its quality and the biological diversity it supports, but also on its relative abundance in that country or locality and the contribution it can make to supporting a local population sustainably.

D. Actions by national Governments

8. To build and strengthen national capacities to deal with environmental problems.

48. To reach these targets in the field of the environment will require the active participation of all countries. Attaining the targets presupposes the ability of all nations to develop appropriate national policies, and adopt the required legislation and to create the institutions necessary for their implementation, to apply appropriate systems of incentives and disincentives and to implement national action plans to deal with national environmental problems, such as deforestation, soil loss, fresh water shortage, and marine, air and water pollution. Attaining the targets will require that all countries have the capacity to monitor the state of their national environment, to identify environmental problems and their sources and causes, to propose solutions which address the causes of the problems, to develop local technologies for sustainable development and to assess properly the environmental impact of imported technologies, as well as the resources to implement the necessary measures.

49. At present, those necessary conditions exist in few countries. To satisfy them in all countries will take a massive investment world-wide in education, training and technical assistance, particularly in developing countries. It will require the developed countries of the global North to share their knowledge and skills with the South on a scale not seriously contemplated before, and to find the financial resources to do so. There is no alternative. Global environmental problems cannot be solved by a few countries on their own. The solution requires the active participation of all countries, all Governments and all people.

9. Rights of the people: to establish, by the year 1995, the right to a clean environment as a constitutional principle at the national level, and protection, in national laws, of the people's 'right to know' and their right to participate in decisions affecting resource use and the state of their environment.

50. Article 25 of the Universal Declaration of Human Rights establishes the right of all people to a standard of living that is adequate for health and well-being. As the maintenance of human health and well-being depends to a large extent on the contribution that the quality of the environment and its main components make to the standard of living, a healthy environment, is by implication, a universal human right. The right to know of policies, decisions and actions affecting the environment and to take part in the decision-making process is necessary if individuals and communities are to be able to defend their right to a healthy environment.

10. By the year 2000 the countries with real GDP per capita above $5,000 should produce a common plan to reduce their consumption of non-renewable natural resources, initially by 20 per cent of the total 1992 level, and then to levels that allow for a transition to renewable substitutes, and to reduce consumption of renewable resources to levels that do not exceed the global rate of renewal.

51. The introduction of natural resource accounting will allow a planned and orderly transition to the sustainable use of renewable natural resources and of pollution sinks. Plans should require a more efficient use of non-renewable resources and the development of cleaner, less-wasteful technologies, so as to reduce the rate of consumption and allow a transition to environmentally sound substitutes. To enhance their effectiveness, the implementation of such plans should involve a public process allowing maximum opportunity for public input, and should, where practicable, use economic rather than regulatory instruments. The ability of developing countries - which are dependant on commodity exports -to adopt such plans will depend on significant reforms being achieved in international trade practices, and on resolution of the current debt crisis.

11. By the year 2000, all countries with a per capita annual energy consumption of over 80 gigajoules should stabilize consumption at 1992 rates and establish programmes to reduce energy use by at least 2 per cent per annum until the 80 gigajoule level is reached. By the same year, an international programme for the meaningful investment of financial and human resources in the development of new and renewable sources of energy should be fully operational.

52. Average per capita consumption of commercially produced energy in 1987 varied from around one gigajoule (GJ) to over 600. Among OECD countries, the variation was from 29 to 291 GJ during that year, and even among the G7 countries it ranged from 105 to 291 GJ (IUCN/UNEP/WWF 1991). While some allowance for climatic factors may be justified, 80 GJ per capita per annum represents a realistic target (for example, France, Italy, and Japan each consumed between 100 and 110 GJ per capita in 1987). Commercial energy consumption per unit of GDP also varies considerably. Among the industrialized countries, the range is from 8 to 34 GJ per thousand dollars of real GDP. The variation is even greater among developing countries, but is less meaningful because of the high proportion of 'non-commercial' energy used in many developing countries. Achieving a consumption level of 80 GJ per capita without loss of real GDP per capita would mean a rate of 6 GJ per thousand dollars of real GDP in the most developed countries, which should be adopted as a planning target.

53. The ultimate goal should be a global transition to new and renewable sources of energy as the basis for sustainable development. If sustainable development is to become a reality, research on alternative energy sources must be given a much higher priority and far greater resources must

be devoted to it than at present. Agreement should be reached without delay on the nature, cost and sources of funding of an international programme of research into new and renewable energy production, which should be fully operational by the year 2000.

E. Actions that require international cooperation

12. (a) To end net global deforestation by the year 2000;

(b) To agree, by 1995, on reforestation targets for each decade of the 21st century in each of the world's ecoregions.

54. The immediate goal should be to stabilize the extent of the world's forest estate then to move towards an increased area of forest. The Noordwijk ministerial conference, attended by 67 developed and developing countries, agreed on 12 million ha a year of net forest growth "in the beginning of next century" as "a provisional aim" (Noordwijk Declaration, 1989) and requested further consideration of its feasibility. Agreement should also be reached on the desirable extent of different forest types (boreal, temperate and tropical) and on realistic reforestation rates within each zone to achieve that extent in the shortest possible time and maintain it thereafter. This will necessitate the careful development of regional, subregional and ecoregional plans, which take into account such factors as the severity of damage already done to forest systems, the critical nature of the area and its impacts on the global environment. To meet this target will need a clear understanding of the causes of deforestation and of workable solutions to deal with the root causes. These solutions will differ between regions, countries and even localities. To identify them will require international technical cooperation and substantial financial resources, in addition to the direct costs of reforestation. A rough estimate of the cost of reforesting some 17 million ha per year to compensate for the current estimated rate of deforestation (taking into account the variation in forest type and economic conditions between regions) is in the vicinity of $4 billion per annum. Compensation costs and the cost of providing alternative economic opportunities in the developing countries involved in putting an end to tropical deforestation need to be estimated.

13. To develop concrete world programmes to combat land degradation in drylands (desertification), which include one or more of:

(a) Preventive measures in areas that are not affected, though vulnerable, and areas that are slightly affected;

(b) Corrective measures in all areas that are moderately affected;

(c) Rehabilitation measures in 50 per cent of areas that are severely desertified;

commencement of their implementation by 1995, and completion by 2015.

55. Over 5 billion hectares of the world's land territories are drylands that are used for some form of agricultural production. An estimated 3.6 billion ha, or 70 per cent, suffer at least a moderate degree of land degradation (vegetation and/or soil degradation); the well-being and future of one-sixth of the world's population are directly affected as a result. Preventive measures to protect the 30 per cent of productive drylands which are unaffected or only slightly affected by desertification are estimated to cost between $1.4 billion and $4.2 billion per year. Corrective measures in

moderately desertified areas are estimated to cost another $2.4 billion to $7.2 billion a year. Rehabilitation measures in 50 per cent of the severely desertified areas are estimated to cost $6.2 billion to $11 billion a year. The total cost estimate for a comprehensive programme of prevention, correction and rehabilitation is $10 to $22 billion a year for 20 years (UNEP, 1992). The direct loss of production due to desertification amounts to about $42 billion annually, but the economic benefit of combating desertification will not come until relatively late in the programme. The protection of productive land is not just a physical exercise, but rests directly on our understanding of the social, cultural and economic (international as well as local and national) causes of land degradation. It therefore requires, in addition to the above programmes, a large expenditure on a well-coordinated international programme of research and country-specific studies.

14. To adopt, by 1995, a global plan (identifying actors, costs and sources of funding) to combat marine pollution from land-based sources. Its target would be the reduction, by the year 2000, of marine pollution from land-based sources to 1990 levels and an agreed programme of continuing reductions in succeeding decades.

56. Pollution from land-based sources is the major imminent manageable threat to the marine environment and impediment to the development of coastal areas and sustainable utilization of oceanic and coastal resources. Land-based sources contribute about 77 per cent to the pollution load of the oceans. The problem is global in nature and requires a comprehensive, sequential and globally coordinated approach. Solving the problem may cost hundreds of billions of United States dollars. To deal with land-based sources of pollution in the Mediterranean alone is estimated to cost between $25 and $100 billion. However, the benefits to be derived, the value of the resources at risk and the cost of the damage if a solution is not found (including damage to human health and to economic activities such as fisheries and tourism, as well as to coastal ecosystems such as mangroves and coral reefs) are expected to far outstrip these costs.

15. To establish by 1995 an international programme to improve the efficiency of irrigation systems and to reduce by 10 per cent each decade the fraction of water abstracted from rivers for irrigation which does not reach irrigated agricultural land.

57. The efficiency of irrigation systems is a major factor affecting the availability of fresh water for agricultural purposes and domestic consumption as well as the quality of the water bodies from which the water is abstracted. In many cases between 40 and 60 per cent of the water abstracted from rivers does not reach the agricultural land for which it is intended. Reducing this wastage by improving the efficiency of irrigation systems will not only allow increased food production, by reducing the demand it will also make available more water for other purposes and allow increased residual river flows.

16. To implement, by 1995, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal and, within its context, to reach international agreement, by the same date; (a) to ban all exports of hazardous wastes to developing countries; and (b) to draw up the timetable for reducing the generation of hazardous wastes.

58. The immediate goal should be to implement fully the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, and to reach agreement, within its framework, on the timetable for ending completely the export of hazardous wastes to developing countries. A further goal should be international agreement on reducing the generation of hazardous wastes world-wide by 30 per cent by the end of this century, and on a realistic timetable for further reductions beyond the year 2000. The costs of ending the export of hazardous wastes to developing countries and the sources of funding to meet them should be established by the end of 1993.

17. (a) To develop, by 1995, a global convention for the exchange of information on chemicals in international trade and establish an intergovernmental mechanism for chemical risk assessment and management;

(b) To establish, by the year 2000, internationally agreed, reliable methods of testing, and harmonized methods of reporting on, the toxicity of chemicals;

(c) To adopt, by 1995, a global convention on the prevention and notification of major industrial accidents involving hazardous chemicals.

59. The immediate goal should be the implementation of the Amended London Guidelines on the exchange of information on chemicals in international trade. The second is to transform the guidelines into a global convention, with special emphasis on the requirement of prior informed consent. A standardized set of information that is adequate for initial hazard assessment should be required, to accompany all chemicals in international trade. At the same time an intergovernmental mechanism for chemical risk assessment and management should be established. A third goal is the adoption of a convention on the prevention and notification of major industrial accidents involving hazardous chemicals. This convention should also deal with the availability of assistance in such cases through a United Nations centre for environmental emergencies. At the same time, technical and financial assistance should be provided to developing countries for the development of an adequate legal, administrative and technical infrastructure for the management of chemicals. Here again, defining the costs will involve the full cooperation of industry, Governments and the scientific and economic communities.

18. To adopt, by 1995, a code of conduct or convention to apply internationally agreed guidelines for environmental impact assessment in the transfer of technology, particularly to developing countries.

60. The transfer of current technologies and the introduction of new and cleaner ones and new materials have the potential to create unanticipated environmental problems, as well as to provide environmental and economic benefits. An internationally accepted and enforceable code of conduct or, preferably an international treaty will ensure that in future commercially developed new and cleaner technologies will have had their environmental impact as well as their benefits adequately assessed. This will also assist in the transfer of environmentally assessed technologies to developing countries, which may not have the institutional capacity to assess the impact of these technologies themselves.

19. To adopt, by 1995, an international treaty on transboundary environmental impact assessment.

61. Principle 21 of the Stockholm Declaration states, inter alia, that "States have ... the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction." To exercise this responsibility fully requires the existence of internationally agreed norms for the assessment of transboundary environmental impacts, as well as measures for consultation between States on the outcome of such assessments.

20. To agree on the means of ensuring compliance with environmental treaties and establish, by the year 2000, appropriate institutional mechanisms to verify their implementation.

62. Most international environmental agreements incorporate obligations to report on their implementation. Some allow for verification by the contracting parties through the creation of special monitoring institutions, but most environmental treaties do not contain adequate mechanisms for verification of their implementation. The increasing importance of these treaties to global security suggests that mechanisms to ensure their implementation should be developed. This will require amendment of individual treaties. To facilitate this process agreement should be reached on the adoption of general procedures that could then be adapted to each environmental treaty.

F. Actions by the United Nations system

21. To strengthen, by 1995, the capacity of the United Nations system and of existing coordination mechanisms within the United Nations system in such a way as to ensure:

(a) That effective assistance is given to Member States individually and collectively to deal with environmental problems; and

(b) The integration of environment into all social and economic development activities of United Nations organs and organizations.

63. Mechanisms exist within the United Nations system for the coordination of environment-related activities and the development and adoption of a system-wide programme for the protection and proper management of the environment and its component natural resources. To ensure that environmental considerations are given due weight throughout the system, and that the environmental activities of all organs and agencies within the system are fully coordinated so that there are no avoidable overlaps or duplications, these mechanisms need to be considerably strengthened, become more authoritative and have adequate finances devoted to their operation. The United Nations system itself needs to be much better financed in order to use its capacity to assist the international community in dealing with environmental problems at the national, regional and global levels.

22. To establish, by 1995, a United Nations Centre for Environmental Emergencies.

64. We are faced with an increasing number of local and regional emergencies resulting from the cumulative effects of human activities. In 1991, the UNEP Governing Council decided to establish, on an experimental basis, a United Nations Center for Urgent Environmental Assistance. This experimental centre, initially established for 18 months only, will maintain rosters of experts and equipment available in emergency situations and develop methodologies to mobilize them. The increasing frequency and scale of environmental emergencies caused by human action suggests that a centre for environmental emergencies is urgently needed. Such a centre would involve the cooperation, coordination and strengthening of existing emergency response systems belonging to organs and agencies within the United Nations system, as well as outside it. It should be established by the end of 1995, and the cost of achieving this target should be carefully assessed by mid-1993.

G. Action by development financing institutions

23. By the year 2000, the major development financing institutions should have strengthened their policies and procedures relating to the environment through the full implementation of the 1980 Declaration on Environmental Policies and Procedures Relating to Economic Development (reprinted in CIDIE, 1991).

65. This can be achieved through, in particular:

(a) Provision of technical and financial assistance to developing countries for the integration of environmental considerations into their national development plans and for the strengthening of their institutional capability to implement sustainable development programmes;

(b) Provision of technical and financial resources to Governments for the application of proper environmental impact assessments to all development projects;

(c) Assistance in promoting the application of environmental economics and resource accounting in the analysis of policies, programmes and projects;

(d) Provision of additional financial resources to assist developing countries to implement international agreements on the environment.

H. Action by non-governmental organizations and citizen groups

24. For major international non-governmental organizations to establish, by 1995, an international non-governmental body to monitor breaches of environmental treaties and national actions leading to or likely to lead to major environmental deterioration.

66. An international non-governmental organization with a network of national bodies could bring to the world's attention breaches of environmental agreements or actions leading to serious deterioration of the environment in a way which an intergovernmental body would find difficult. The only meaningful way in which international agreements on the environment can be implemented is by translating them into national legislation and enforcing it. A body structured along the lines of Amnesty International (and perhaps called 'Environment International') could play a role in relation to environmental agreements similar to that of Amnesty International in the field of human rights.

IV. CONCLUSION

67. The final chapter of the present review of trends in the world environment during the last two decades brought us back to the theme of the preface, that there has been too much talk about environmental degradation and too little action to halt it since the Stockholm Conference of 1972. Despite the very real achievements and advances of recent years the state of the world environment and the living conditions of many of its people have continued to get worse. Unless the world community is prepared to act decisively and cooperatively to deal with the major environmental problems facing the world and their basic causes, the rate of degradation of our living environment will increase rapidly. It is no exaggeration to say that the ability of the biosphere to continue to support human life is now in question. That fact should compel us to implement what we say we will do.

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